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Part X

Department of Transportation

Federal Railroad Administration

Requirements for Lifting Lugs

DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

[49 CFR Chapter II]

[Docket No. RSSI-78-6; Notice No. 4]

Association of American Railroads Requirement for Lifting Lugs; Termination of Safety Inquiry

AGENCY: Federal Railroad Administration, DOT.

ACTION: Termination of special safety inquiry.

SUMMARY: This document terminates the Federal Railroad Administration (FRA) special safety inquiry into an Association of American Railroads (AAR) requirement that all freight cars ordered after July 1, 1978, be equipped with provisions for lifting. The FRA has concluded that the AAR requirement, with certain adjustments related to tank cars used for the transportation of hazardous materials, has not been shown to affect adversely the safety of railroad wreck clearance operations.

DATES: The special safety inquiry is terminated on publication of this notice in the Federal Register.

FOR FURTHER INFORMATION CONTACT: Rolf Mowatt-Larssen, Office of Safety, FRA, 202-426-0924 or Grady C. Cothen, Jr., Office of Chief Counsel, FRA, 202-426-8220.

SUPPLEMENTARY INFORMATION:

Background

In 1977, the AAR adopted a standard entitled "Provision for Lifting Freight Cars;'" which was made applicable to all cars authorized for use in interchange service and ordered after July 1, 1978 (Performance Specification S-234). Issued as a part of AAR Mechanical Division Circular D.V. 1897, this standard states in part:

> The purpose of this provision is to provide a means to vertically lift a loaded upright car. This provision is for new and rebuilt cars to facilitate rerailing operations and to improve the method of handling derailed cars.

Provisions for lifting of the kind described in the circular are generally known as "Lifting lugs" and provide a place of securement for crane hooks used in the course of wreck clearance operations.

On September 15, 1978, the FRA received a "Petition for Emergency Exemption" from the following: General American Transportation Division of GATX Corporation, North American Car Corporation Division of Tiger International, Pullman Leasing Company Division of Pullman, Inc., Shipper Car line Division of ACF Industries, Inc., and Union Tank Car Company Division of Trans Union Corporation. Although referring to alternate authority, the petitioners relied principally on 49 CFR 107.113, which governs the processing of petitions for emergency exemption from the Department of Transportation Hazardous Materials Regulations. Petitioners urged that the action of the AAR Mechanical Division in making the lifting lug standard applicable to tank cars represented an exercise of authority delegated by the Department to the AAR under 49 CFR 179.3 and 179.4. It was and remains the opinion of the FRA that the action of the AAR did not fall within the scope of any delegation from the Department and, thus, that neither FRA nor the Materials Transportation Bureau (MTB) could properly take jurisdiction of the petition under 49 CFR 107.113.

However, the FRA believed that issues raised by the petition concerning the safety of the design specifications set forth by the AAR for lifting lugs were of sufficient gravity to warrant examination prior to the construction of a significant number of cars under the AAR design standard. Therefore, utilizing its authority under the Federal Railroad Safety Act of 1970, the FRA published an order temporarily staying the effectiveness of the AAR lifting lug requirement (43 FR 46106; October 5, 1978). At the same time, FRA commenced a special safety inquiry to examine the safety of lifting lugs with respect to all freight cars, including tank cars (43 FR 46052; October 5, 1978).

Public Hearing

On October 31, 1978, a public hearing was held in Washington, D.C., for the purpose of receiving public comment on the matter of the AAR standard. A total of 16 witnesses testified at the hearing, including representatives of the AAR, two firms specializing in wreck clearance operations, and the tank car companies. Written submissions were received from several additional parties. An FRA Board of Inquiry addressed questions to the witnesses based on the testimony presented and FRA data relating to wreck clearance operations.

At the conclusion of the hearing, it was FRA's general conclusion that no evidence had been presented which would justify the issuance of Federal regulations either requiring or prohibiting the application of lifting lugs to tank cars or other freight cars. The testimony did tend to indicate that, properly utilized, lifting lugs could assist in stabilizing and lifting cars during wreck clearance operations. However, FRA remained concerned that lugs designed to the minimum specifications of the AAR standard might be subject to misuse under certain limited circumstances, posing a safety hazard to railroad employees and the general public.

Safety Considerations

The AAR design standard contemplates that four lifting lugs be placed on each car, "preferably in or near the body bolster at the side sill." The standard further provides:

> The design force at each provision for the upright car must be 40 percent of the gross rail load applied within 15 degrees of the vertical axis of the upright car. Each connection zone must be designed to support the above load without exceeding the yield strength of the material except that local deformation is permitted to achieve hook bearing area.

The principal question raised in relation to this standard was whether it presented an undue invitation to misuse. Since the AAR standard contemplates the use of lifting lugs only when a car is essentially upright and the angle of lift falls within a 15 degree "cone", lugs designed to the minimum specification could not be safely employed in many situations. Therefore, FRA was prompted to ask: would the risk that lugs might be used beyond tolerances incorporated in the AAR design outweigh their usefulness when employed as intended?

The written and oral testimony presented at the hearing, together with FRA's own analysis of recent fatalities related to wreck clearance operations, pointed to several basic conclusions. First, wreck operations are, by their nature, ad hoc undertakings which involve inherent dangers. The application of crane hooks to portions of freight cars not intended for the purpose of lifting is a common, and sometimes necessary, expedient. The sue of a sling arrangement for lifting, while often a preferred strategy, is not always possible. Even when it is possible, employees engaged in placing the sling around the car may be subjected to extreme hazard unless the car is properly stabilized.

The second conclusion that emerged from the testimony was that most standard freight car designs will permit the application of lugs that greatly exceed the AAR standard with respect to directionality of load capacity. It is expected that most lugs applied on the body bolster at the side sill will, in fact, provide a margin of safety should the

lugs be subjected to unintended use beyond 15 degrees from the vertical centerline of the car.

The third conclusion that may be derived from the evidence is that places of securement for crane hooks on freight car bodies can, if properly utilized, prevent undesired movement of hooks and loss of control. In 1978, two fatalities were caused, in separate accidents, when crane hooks became dislodged from portions of freight car bodies. One of those instances, which involved a loaded covered hopper car, recalled a similar accident on the Lehigh Valley Railroad in 1974 which resulted in two fatalities. FRA notes in this regard that, by virtue of their design and high center of gravity, certain covered hopper cars present special problems in wreck clearance operations and should be handled with great care. The application of properly reinforced lugs to those cars could materially facilitate their handling in wreck clearance operations.

The fourth conclusion developed from the hearing was that the history of lugs applied to locomotives and passenger cars, as well as an undertermined number of freight cars, does not reveal any pattern of failure of lugs during wreck clearance operations.

The fifth conclusion derived from the special safety inquiry is that no standard procedures for wreck clearance exist within the railroad industry. FRA is hopeful that the convening of a special safety inquiry into the safety of lifting lugs will, at a minimum, serve to remind the railroads and wreck clearance specialists that lifting lugs should be used within the limitations of the design standard. Further, FRA is hopeful that the inquiry may promote a recognition within the industry of the need to develop comprehensive guidelines for the conduct of wreck clearance operations.

In order to promote the development of techniques and guidelines for the safe conduct of wreck clearance operations, the FRA Office of Research and Development is undertaking a study of wreck clearance procedures. FRA will seek the active participation of the railroad industry and wreck clearance specialists in the conduct of the study. Special attention will be given to the handling of hazardous materials cars following derailments.

The final conclusion derived from the special safety inquiry is that modern railroad tank cars used for the transportation of hazardous materials present special problems with respect to the application of lifting lugs. Stub sill tank cars are, by design quite different from the standard box car. Because tank cars are more difficult to handle during wreck clearance operations, it can be predicted with some certainty that lugs will be used frequently and in a number modes. Unfortunately, tank car bolsters are not as readily adaptable to the application of lugs that provide a margin of safety in excess of the AAR standard. Further, the mishandling of a loaded tank car that may have been damaged in a derailment could result in the release of hazardous materials. Therefore, FRA determined that further action would be appropriate to strengthen the AAR standard as applies to tank cars used for the transportation of hazardous materials.

FRA Recommendation to AAR

By letter of November 9, 1978, the Federal Railroad Administration recommended to the AAR that the design standard for lifting lugs be strengthened with respect to the application of lugs to tank cars used in hazardous materials service. In particular, FRA recommended that the AAR adopt a more rigorous standard for lugs applied to tank cars, including provisions for testing.

It should be noted that these recommendations were issued on the assumption that the AAR has determined to leave in place the requirements of the lifting lug standard with respect to all freight cars. The FRA does not express any view as to whether provisions for lifting should be required or whether the AAR requirement is cost beneficial, since those matters are beyond the scope of this inquiry. Rather, the FRA is concerned that any lifting lugs that are applied to cars be reasonably safe for their intended use.

Subsequent to the letter of November 8, 1978, the AAR referred FRA's recommendations to its several technical committees. An informal conference was held with representatives of the AAR on March 2, 1979. At that time, the FRA clarified its written recommendations by noting that the proposed test requirement relating to tank lugs was intended to apply only to the prototype of each lug design. AAR representatives noted the importance of retaining a standard lug specification to avoid confusion over the circumstances in which lugs may be used for lifting tank cars and other freight cars. At that time, the AAR indicated its willingness to incorporate into its standards for tank cars a requirement that lug designs for tank cars be tested to asssure a reasonable margin of safety that would resist failure should a car be inadvertently lifted at an angle to the vertical exceeding the 15 degree standard.

On April 20, 1979, the AAR issued a test requirement for tank cars (AAR 24–6 Lifting Provision Test), which applies to new tank cars ordered after July 1, 1979:

> This test refers to the lifting provision requirements shown in Performance Specification S–234 of the Manual of Standards and Recommended Practices. Each design of a tank car lifting provision is subject to a test by loading at least one of the lifting provisions as follows:
>
> 1. The vertical component of the load applied to each lifting provision tested must be a minimum of 25% of the gross weight on rail.
>
> 2. The direction of the applied load must be at 45° from the vertical and as near as possible to a vertical plane parallel to the longitudinal center line of the car and extending through center of lifting provision.
>
> 3. After application and release of the required load, visual inspection must reveal no evidence of permanent deformation in the tank car tank, bolster or lifting provision except that local deformation is permitted in the hook bearing area.

Lug designs capable of meeting this test should provide an adequate margin of safety beyond the 15 degree design standard to avoid failure in the case of inadvertent misuse.

It should be emphasized that the design and use specification of the AAR requirement remains unchanged. Lugs are to be used to lift only cars which are in an essentially upright position. On January 5, 1979, the AAR acted to commence distribution of information concerning the proper use of lugs by issuing an instructional bulletin.

In consideration of the AAR's undertakings and the information received throught the special safety inquiry, the FRA has determined that the special safety inquiry on lifting lugs should be concluded and that the initiation of further proceedings related to the subject matter of the inquiry is not necessary. Accordingly, FRA Docket No. RSSI–78–6 is closed. By separate notice published elsewhere in today's Federal Register, FRA has also vacated the stay order which temporarily enjoined the operation of the AAR standard.

Issued in Washington, D.C. on May 15, 1979.

John M. Sullivan,

Administrator.

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DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

[Docket No. RSSI-78-6; Notice No. 3]

Association of American Railroads; Requirement for Lifting Lugs; Removal of Temporary Stay

AGENCY: Federal Railroad Administration, DOT.

ACTION: Revocation of Temporary Stay Order.

SUMMARY: The Federal Railroad Administration (FRA), after hearing, has determined that a temporary order staying the effectiveness of the Association of American Railroads (AAR) requirement concerning provisions for lifting on newly constructed freight cars should be vacated. This action permits a portion of an AAR circular that specifies requirements for cars used in interchange service to become effective.

DATES: The temporary stay is vacated effective on publication in the **Federal Register.**

FOR FURTHER INFORMATION CONTACT: *Primary program drafter:* Rolf Mowatt-Larssen, Office of Safety, FRA, 202-426-0924; *Primary legal drafter:* Grady C. Cothen, Jr., Office of Chief Counsel, FRA, 202-426-8220.

SUPPLEMENTARY INFORMATION: The FRA describes, in a separate document published in the proposed rules section of today's **Federal Register**, the findings and conclusions reached in its special safety inquiry concerning the AAR requirement that freight cars ordered after July 1, 1978, be equipped with provisions for lifting ("lifting lugs"). For reasons set forth in that document, the temporary stay order published in the **Federal Register** of October 5, 1978 (43 FR 46106), is vacated.

Issued in Washington, D.C. on May 15, 1979.

John M. Sullivan,
Administrator.

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